The Warfighter's Pipeline

A Blueprint for Aligning Defense Acquisition with Venture Capital

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OVERVIEW AND RECOMMENDATIONS

As near-peer adversaries rapidly enhance their capabilities, US defense and intelligence leaders can no longer afford to treat full partnership with the emerging, venture-backed defense technology ecosystem as optional—it is increasingly a strategic necessity.

In this essay, we present the following arguments:

- Fully accessing nontraditional industrial partners' capacity to develop defense capabilities is critical to future warfighter success.
- Effectively shepherding new capabilities from concept to battlefield requires aligning early-stage defense innovation pathways with the realities and expectations of the venture capital financing model.
- Fully realizing the potential of this new industrial base necessitates planning beyond innovation programs; the acquisition system needs to include positive incentives for decision makers to accept the risks inherent with moving beyond the traditional defense industrial base.

Fortunately, we believe that creating this alignment can be accomplished with relatively modest policy and legislative changes, coupled with decisive leadership and expectation setting. Implementing this blueprint should represent a clear chance for a "win" in defense acquisition reform.

LEGISLATIVE RECOMMENDATIONS

Originally created in 1982, the Small Business Innovation Research (SBIR) program has funded more than $35 billion in Department of Defense research and development

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contract awards, with more than $1.5 billion in annual funding opportunities. As the current legislative authorities for this program expire in fall 2025, Congress has a rare opportunity to provide clarity on its strategic intent.

We recommend that the 2025 reauthorization seek to maximize the scope and breadth of operationally fielded warfighter capabilities developed by small businesses. Based on our research, the best avenue to achieving this goal is the creation of a Department of Defense–wide program modeled on the Air Force's Strategic Funding Increase (STRATFI) program, including the following features:

- A larger, predefined SBIR amount that may be awarded to small businesses without requiring a waiver from the Small Business Administration, when matched by non-SBIR funds.
- The provision of multiple STRATFI-like awards, within a given fiscal and temporal limit.
- A clear articulation of the matching expectations from non-SBIR government funds and private capital, including the provision that private matching capital must come after the award.
- A minimum fraction of the Department of Defense (DOD) extramural research and development (R&D) budget to be allocated to STRATFI-like awards.
- A provision for increased access to funds for administrative overhead, perhaps up to an additional 1 percent of total SBIR funds.
- Reporting requirements to clearly state within the Federal Procurement Data System whether or not a given contract was awarded under this category or counts as a Phase III commercialization SBIR.

Furthermore, the 2025 National Defense Authorization Act (NDAA) should consider an annual SBIR-like levy on congressional program appropriations, or a separate appropriation, that would be competitively awarded by the service acquisition executives of the various military departments to program offices in order to provide the necessary matching funds for STRATFI-like and/or Phase III SBIR awards.

IMPLEMENTATION RECOMMENDATIONS

- The military departments should implement multiphase, STRATFI-like awards with increasing matching requirements and increasing total contract values, consistent with the expectations of private investors. These contracts should each run for a twenty-four-month period of performance.

- The military departments should consider allocating a substantial portion of their total annual SBIR allocation to these STRATFI-like programs, on the order of 30–50 percent of the total budget.
- The military departments should create clear, positive incentives for program executive officers (PEOs) to access and commit to these STRATFI-like programs.
- The defense acquisition executive (DAE) should provide clear guidance and education to the acquisition and contracting workforce on the appropriate prioritization and usage of Phase III SBIRs.
- The military departments should measure, track, and communicate key metrics associated with time-to-award and payments against awards.

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A RISK AND AN OPPORTUNITY

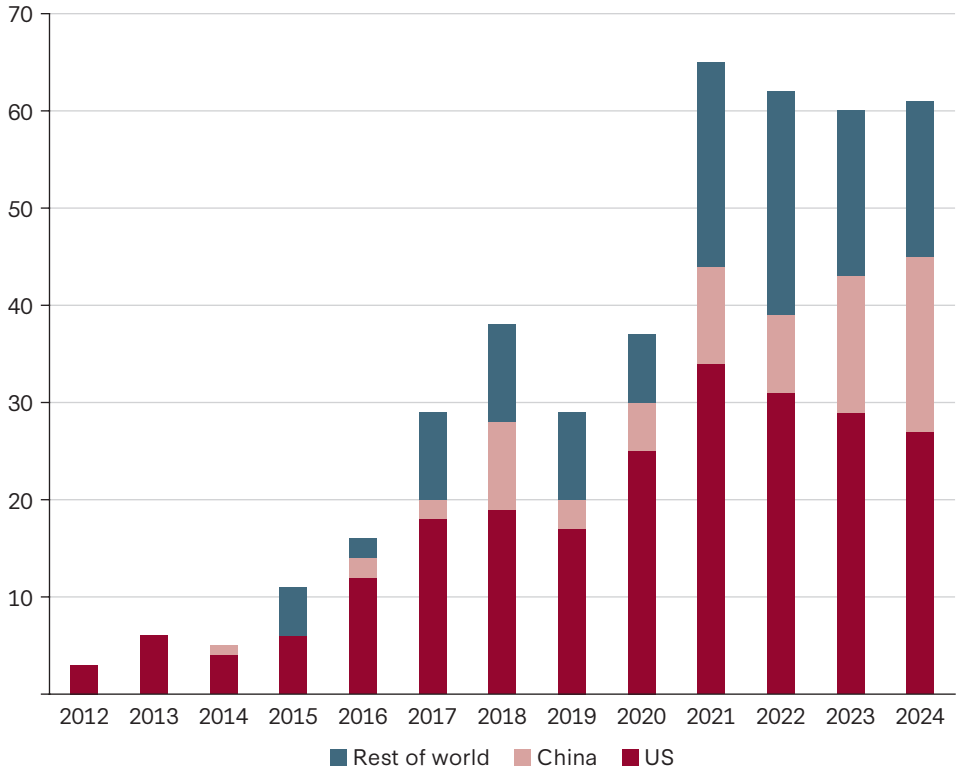
Mississippi Senator Roger Wicker, in his recent report "Restoring Freedom's Forge," captured the urgency of the present moment for venture-backed defense technology companies: "If DoD does not start transitioning new innovative companies into production, private capital will dry up sooner or later. DoD cannot squander a chance to work with an entire generation of the country's finest entrepreneurs."[1]

Although Silicon Valley had deep roots in defense innovation during the 1960s, it pivoted sharply in the 1990s and 2000s toward social media and enterprise software—often explicitly distancing itself from defense and intelligence partnerships. However, in the mid-2000s, efforts led by In-Q-Tel and later the Defense Innovation Unit began rebuilding these bridges alongside entrepreneurs pioneering advancements in small satellites, launch vehicles, and data analytics.

This shift has given rise to innovators who not only understand the complexities of building a Silicon Valley startup but also the intricacies of Washington and the needs of warfighters in the field. Many of these entrepreneurs have forged deep relationships inside the Department of Defense and across the US Intelligence Community.

This new generation of leaders—modern-day Kelly Johnsons, Hyman Rickovers, and Gene Kranzes—has emerged with the opportunity to create just as much impact as their forebears. Yet, far too many of their companies remain trapped in the so-called valley of death, making modest progress with research and development (R&D) funding but never securing the substantial programs of record that signal true partnership.

FIGURE 1 Number of new companies, by year, raising initial venture capital within the aerospace and defense sectors



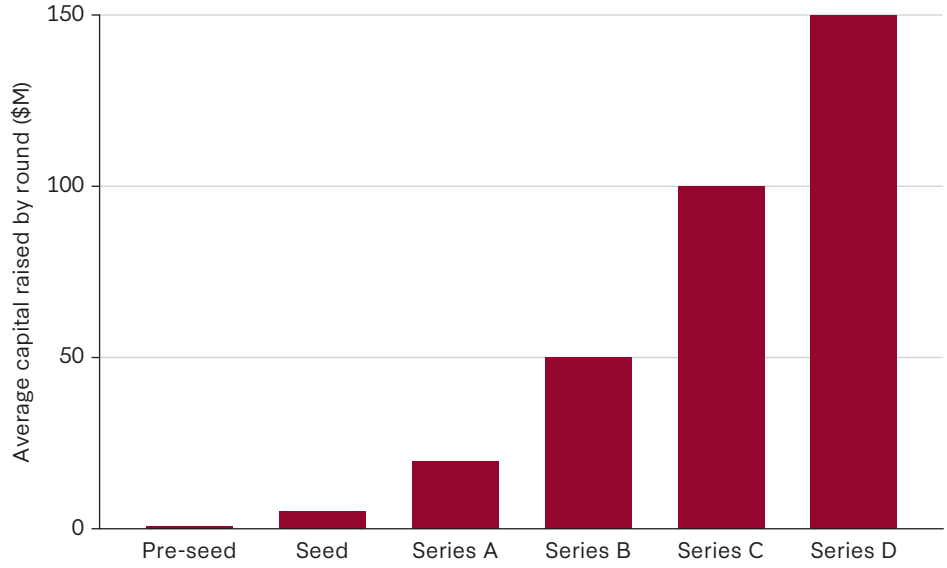
Source: PitchBook Data Inc.

Our research, based on interviews with these companies and with government decision makers, as well as analysis of private fundraising and government contracting data, suggests that fully realizing the potential national security benefits of this emerging defense industrial base requires three fundamental changes: (1) a clear engagement model, (2) dollars to match intent, and (3) freedom from restrictive current policies.

THE NEW INDUSTRIAL BASE: CRITICAL BENEFITS FOR NATIONAL SECURITY

The core of the new defense industrial base consists of approximately two hundred venture-backed companies that have closed initial investments since the mid-2000s, with either a primary or secondary business function to support defense and intelligence applications. This is a subset of the broader venture-backed aerospace and defense sector, which has created about six hundred total companies in the same time frame (see figure 1).

FIGURE 2 Average amount of capital raised by 170 active defense tech companies by funding round (2014 to present)



Source: PitchBook Data Inc.

On average, a venture-backed defense tech company will raise about $300 million along the path to an operationally deployed product. This capital is raised in tranches, called financing rounds, with investors requiring increasingly concrete market demand signals prior to each sequential round. Whereas a team with a good idea and strong industry background can secure a $5 million seed round with modest early revenue, scaling to the $50–$100 million financing rounds needed for full operational deployment (see figure 2) typically requires demonstrating substantial customer traction—upwards of tens of millions of dollars in recurring annual revenue.

Each financing round typically funds the company for another eighteen to twenty-four months of execution. In step with these numbers, it is common for a seed-stage company to have about ten employees, a Series A or Series B company to have between twenty-five and seventy-five employees, and a Series C or Series D company to have between one hundred and five hundred employees, with the vast majority of those employees being engineers.

All in all, each of these companies represents about half a million hours of engineering effort over their first five years, usually generated by employees with experience spanning Silicon Valley internet companies to the traditional defense industrial base. In addition to engineering effort, most companies that pursue hardware-based products or services will spend 5–10 percent of this total capital pool within their own supply chain, representing perhaps $15–$30 million in expenditures to suppliers.

This sector brings several critical benefits to US national security:

1. By operating outside of classified environments, it is able to rapidly integrate the bleeding edge of available component technologies into the design process.
2. It typically draws a talent pool that has seen software and computing systems operate at significant scale in an environment of rapid iteration.
3. It brings a workforce to the problems of the US defense establishment that may not otherwise contribute to its requirements.
4. It brings a degree of so-called red teaming to current US defense strategy.[2] If a group of Silicon Valley entrepreneurs can identify a useful defense technology while operating outside the traditional defense industrial base, it is highly likely that US adversaries will identify the same approaches.
5. By raising private sector financing, these companies are able to explore creative approaches to defense problems while efficiently making use of taxpayer funds.

Overall, this sector enables a substantial amount of risk and cost sharing during the earliest phases of concept exploration and prototyping. This leads to a fundamentally new model for defense-focused research and development.

A NEW MODEL: INVESTOR + TAXPAYER RISK SHARING

Rapid technological advances, by definition, involve risk. However, accepting risk means accepting the possibility of failure—an uncomfortable proposition for any government acquisitions professional. In the public sector, risk offers no upside—only the potential for negative career consequences: a lost promotion, a congressional hearing, or an unwelcome headline.

In contrast, the private sector not only tolerates risk but embraces it. Venture capital, in particular, thrives on risk and failure. The economics are straightforward: A venture capital firm raises a fund with the goal of tripling investors' money within seven to ten years. To achieve this, the firm makes investments in forty to eighty companies, depending on the total size of the fund. Eventually some of these investments "exit," either through an acquisition or initial public offering. In doing so, venture firms expect a small fraction of the companies in their investment portfolio to "return the fund" by generating a return similar to the fund's total size. Ideally, one of these companies will far exceed expectations.

As companies progress through successive rounds of financing, early investors must continue to participate in order to avoid excessive dilution of their ownership. However, these later-stage investments require significantly larger sums of capital, and therefore venture capital firms cannot afford to spread their funds equally across every company to which they provide an early investment. Instead, they must selectively double down

on the most promising ventures, allowing others to fail in order to preserve resources for those that will ultimately succeed.

This dynamic stands in stark contrast to the government's current approach to managing risk. Things started out well enough, as in 1953, the U-2 spy plane request for proposal was reportedly just two pages long. Rather than using excessive process, program risk was managed by close relationships and constant communication between Kelly Johnson and Richard Bissell.[3]

In contrast, when the C-17 transport aircraft specification was developed in the early 1980s, it filled a flatbed trailer with thousands of pages of requirements and technical drawings.[4] Over time, a vicious cycle emerged: As systems became more complex, additional requirements were introduced in an attempt to mitigate the risk of *any* failure. This overprescription drove up costs, which in turn justified even more oversight and risk management measures. Ironically, this approach often created more risk than it mitigated, leading to ballooning costs, longer timelines, and reduced innovation.

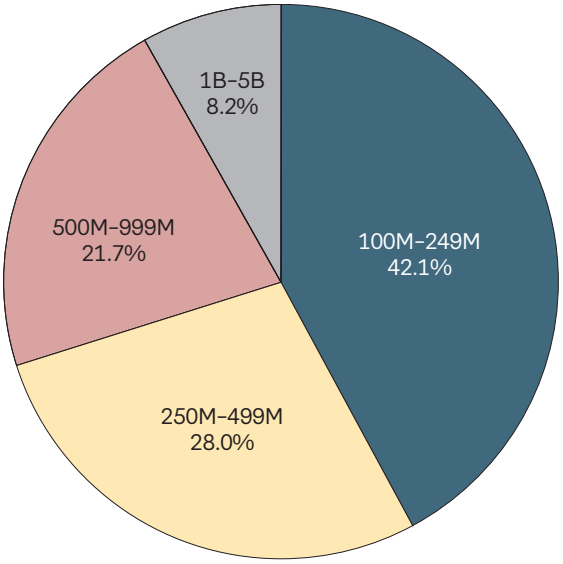
Over the past fifteen years, venture-backed companies have begun to demonstrate an alternative, risk sharing approach for developing new defense technologies. Traditionally, the conceptual design, trade studies, and requirements-generation process occurred entirely within government, where incentives pushed risk management toward excessive complexity. Once this process was complete, a specification was released, and industry could bid—essentially competing to execute a preordained solution to an (often) now-dated problem.

In this model, the government not only dictates the approach but also bears the entire financial burden, from early R&D to full operational deployment. This approach necessitates intense oversight and risk aversion, forcing decision makers to pick "winners" early—not necessarily winning companies, but winning concepts.

However, in the new, venture-inspired model, private investors can assume a substantial portion of the early financial risk for capability development. Venture-backed companies excel at exploring unconventional design trade-offs to solve customer challenges. By deeply understanding both mission needs and the current frontier of technology, they identify rapid pathways to "80/20" solutions—creative, cost-effective approaches that solve most of a problem while maximizing flexibility and speed. Once that 80/20 is completed, many options exist for taking the concept to full operational deployment, including the company continuing to raise private capital to scale up its capabilities and/or partnering with a traditional prime contractor.

For the government, this model delivers leverage on taxpayer dollars. Instead of footing the entire burden of new capability development, from feasibility to operational deployment, private investment can amplify each government dollar invested in at least a 1:1 ratio and, in some cases, as much as 10:1.

FIGURE 3 Distribution of new US venture funds by size ($), 2013–2024



Source: PitchBook Data Inc.

This shift not only reduces the burden on taxpayers but also accelerates innovation, fosters a robust industrial base, and allows for greater adaptability in addressing emerging threats. The challenge now is to determine whether government leaders will embrace this paradigm—or remain locked in a risk-averse system that increasingly struggles to keep pace with technological change.

BEYOND HOPE AND HYPE: ALIGNING DEFENSE AND VENTURE INVESTMENTS

Private investors accept risk, but they also expect significant financial returns for doing so. Venture capital firms rely on a few high-performing companies—typically four or five per fund—to drive overall returns. With the median US venture fund managing about $500 million (see figure 3), these firms aim for each successful investment to be worth 0.5 to 1.5 times their total fund size at exit. Assuming typical valuation multiples based on trailing twelve-month revenue, this means investors need confidence that a company can eventually generate $250–$750 million in steady annual revenue.[5] Some of this can come from international defense or commercial sales, but many of today's most promising companies develop capabilities exclusively for US warfighters and intelligence analysts, making US government contracts their primary path to sustainability.

Venture capitalists often say that financings need to be "a bridge, not a pier"—meaning there needs to be an achievable strategic pathway between the major stages of the company. This mind-set applies directly to venture-backed defense tech companies, which must navigate the gap between early-stage R&D and large-scale operational deployment.

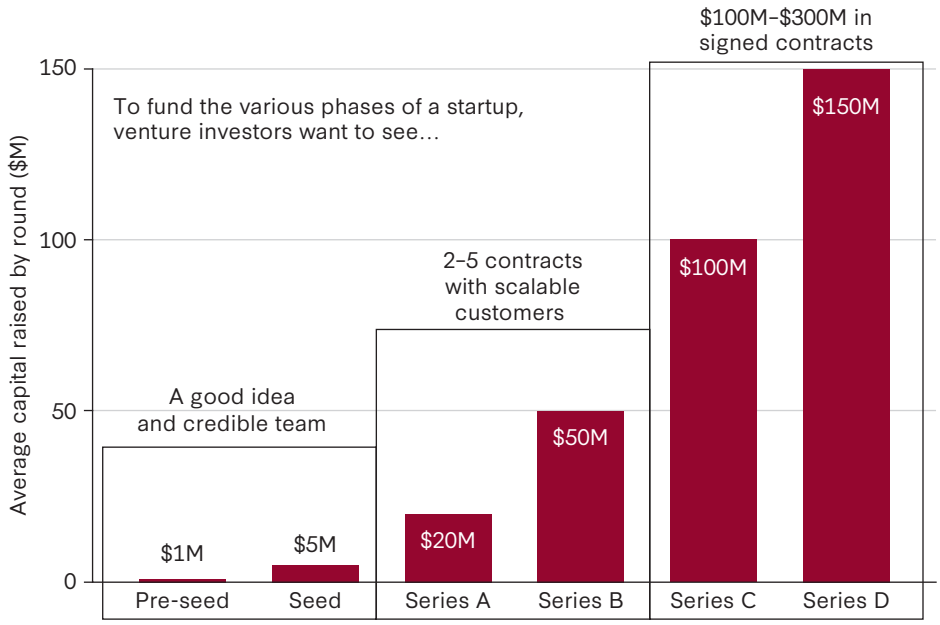
On one side of this gap is the research and development phase, often categorized as basic or applied research and component development. On the other side of this gap lies full operational deployment, where a company has the capacity to generate hundreds of millions of dollars in sustained revenue. Between these two endpoints lies the valley of death. Though well-documented, this challenge is rarely examined from the perspective of venture investors, whose capital must be carefully deployed in phases. Without a clear understanding of investors' motivations and constraints, policy efforts may fail to align with the realities of defense startup growth.

In the risk sharing model, the transition from private capital to government-driven solvency does not happen all at once. A startup cannot develop a cutting-edge capability in isolation and expect the government to immediately award a large production contract. The transition must be incremental, occurring over multiple financing rounds and product milestones. A typical defense tech company requires about $75 million to develop a testable prototype and an additional $100–$250 million to scale to an operational capability. Early-stage seed funding is often based on the strength of the founding team and market potential rather than direct government engagement. However, by the time a company raises a Series A, typically around $20 million, investors will expect some early traction with government customers, often in the form of Small Business Innovation Research (SBIR) Phase II awards, Defense Innovation Unit (DIU) prototype contracts, In-Q-Tel work programs, or expressions of interest from foreign defense buyers.

For many startups, the valley of death begins as they attempt to raise the Series B round, when the company may need upwards of $50 million in fresh capital. At this stage, investors require greater confidence in the company's future revenue—confidence that is difficult to provide. The company is often still refining its prototype, with no product yet ready for delivery. Unlike commercial markets, where companies can secure contingent sales agreements, the DOD typically lacks the authority to sign "build it and we will come" contracts. This uncertainty makes the Series B round one of the most difficult to close for companies building capabilities purely for the defense market. Companies that do successfully raise this funding then face an even larger challenge at the Series C stage, when they must secure upwards of $100 million to transition from prototype to full-scale production. At this point, investors must have absolute conviction that the company will generate sustained revenue at a level that justifies continued investment (see figure 4).

Once a company crosses this threshold, it typically has a viable operational product, strong customer relationships, and a contract base large enough to support continued growth. To aid new companies and capabilities in achieving this milestone, Congress has introduced several innovation programs designed to reduce investment risk by signaling both capital availability and future demand. Among the most significant of these is the Commercialization Readiness Program (CRP), which began as a 2006 pilot program before becoming permanent in the SBIR and STTR (Small Business Technology Transfer) reauthorization of 2011.[6] The CRP provides incentive flexibility for Department of

FIGURE 4 Market demand signal expectations for venture investors



Source: Figure by the authors using data from PitchBook Data Inc.

Defense components with an SBIR program to transition technologies from R&D into sustained procurement contracts.

The Department of the Air Force has led the way in using the CRP mechanism to bridge this funding gap through the Strategic Funding Increase (STRATFI) program, managed by AFWERX, the innovation arm of the Department of the Air Force, including its space-focused component, SpaceWERX. Originally launched in 2020 under AFVentures, STRATFI provides substantial sequential SBIR Phase II awards with funding contingent on matching contributions from program offices and private investors. The program allows for SBIR awards between $3 million and $15 million, with a period of performance of up to four years. Although there are several award configurations, the most common type requires a 1:1 match from program offices and a 2:1 match from private capital, meaning, in principle, that three dollars in non-SBIR funding is catalyzed for every dollar of SBIR funding awarded.[7]

Between 2019 and 2024, approximately sixty-five companies received STRATFI awards through the Department of the Air Force. The Army and Navy have since launched their own CRP-based initiatives, but their matching awards remain smaller due to more limited SBIR budgets. For venture-backed defense startups, these programs provide a structured, staged path from early R&D to sustainable procurement contracts. The programs are an important step toward accelerating the transition of emerging technologies from prototype to full operational capability. However, their implementation is still fundamentally misaligned with the timeline and scope of revenue required for venture-backed startups to fully unlock the potential of nontraditional defense innovators.

MILESTONE MISALIGNMENT BETWEEN ACQUISITIONS AND FUNDRAISING

One core challenge in bridging the valley of death is aligning increasing expectations of private investors with stronger demand signals from government customers. If venture-backed startups could raise $500 million in a single financing round, or if the government could provide early, pre-product companies with a $500 million multiyear guaranteed contract, this problem wouldn't exist. But the reality is different: Both startups and the government operate incrementally.

The current implementation of the STRATFI program illustrates both the challenges and potential solutions to this misalignment. As discussed earlier, the average defense tech startup requires approximately $75 million in private capital to field a testable prototype and another $100–$250 million to reach full operational capability. The investor math behind these financing rounds dictates that by the time a company raises a Series C round, it must demonstrate sustained revenue and growth, often in the range of $30–$40 million annually, or more (see table 1). Yet, many venture-backed defense companies struggle to meet these benchmarks because their primary customers—government agencies—lack procurement mechanisms that match the pace and expectations of venture investors.

For early-stage defense startups, the sales milestones that unlock initial fundraising often consist of a mix of smaller Phase I and Phase II SBIR awards, international contingent revenue, and early-stage agreements with distribution partners. As they approach the critical Series B round, most companies have only proven component-level capabilities rather than a fully integrated, testable prototype. As a result, their actual revenue falls below expectations (see figure 5), and they must rely on a mix of "selling the vision," endorsements from motivated future customers, and investors with a deep understanding of national security needs. Falling short of revenue targets leads companies to raise

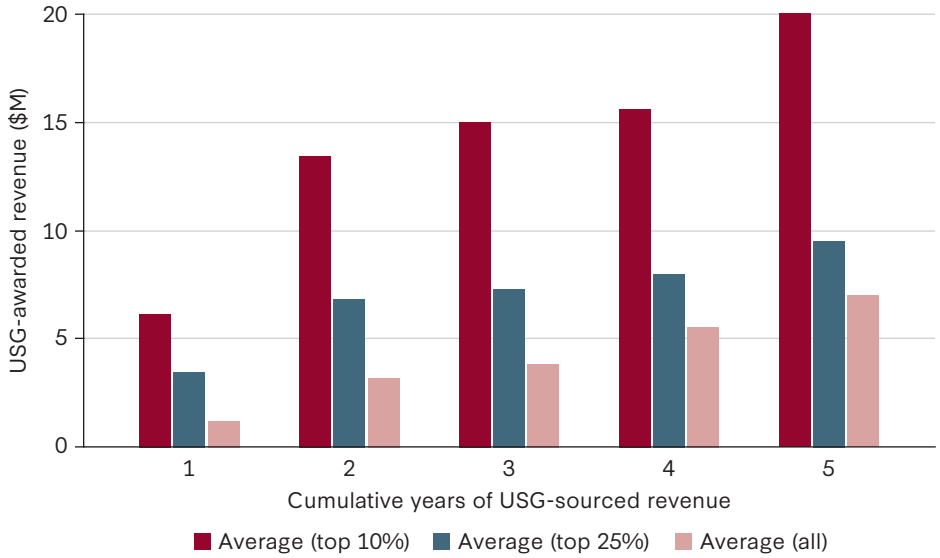
TABLE 1 TYPICAL VENTURE FINANCING SIZE, VALUATION, AND REVENUE REQUIREMENTS FOR US-BASED DEFENSE TECH COMPANIES, BY ROUND

Financing round	Approximate capital raised ($M)	Approximate postmoney valuation ($M)	Minimum annual revenue target ($M)
Series A	25	80–100	8–10
Series B	50	150–200	15–20
Series C	100	300–400	30–40

Postmoney valuation represents the company's total value after an investment round. Typically, new investors receive about 25 percent ownership for their capital. With investors expecting companies to be valued at ten times annual revenue, this creates clear revenue targets for founders to achieve.

Source: Investor interviews by the authors

FIGURE 5 Average annual contract awards for new venture-backed defense tech companies over the first five years of US government-sourced revenue



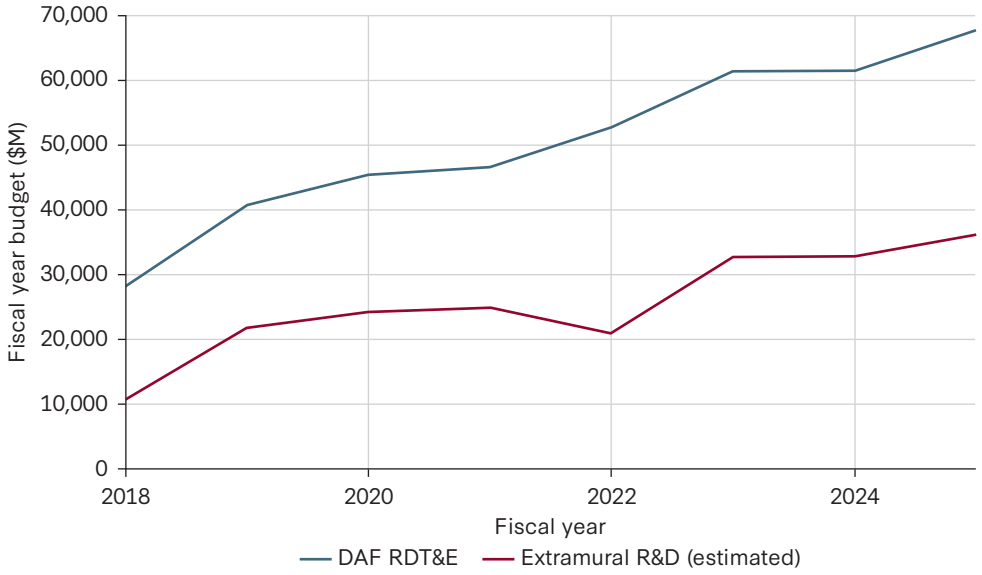
Source: Federal Procurement Data System

less than they need under less favorable terms, reducing their ability to refine their prototype and build a strong foundation for scaling into production.

To fill this gap, many companies have pursued a STRATFI award. Ideally, such an award could serve as the demand signal that enables companies to raise the financing required to transition to operational deployment. However, today's implementation often falls short. Companies frequently announce securing a $60 million STRATFI award—structured as $15 million in SBIR funds, $15 million in program office contributions, and $30 million in private investment—but in reality, much of that private capital was raised in the prior twenty-four months, not as new investment driven by the award itself. Moreover, the $30 million in government funding can take up to four years to materialize, if it materializes at all. Even in the best-case scenario, where $15 million in current-year funding is matched by $15 million in SBIR allocations, the resulting revenue barely meets the minimum threshold required to raise the next round of private investment. This reality leaves many STRATFI recipients stuck, spending more time chasing incremental funding through demonstrations and exercises than focusing on deploying operational capabilities.

Additional current legislative and programmatic constraints further reduce STRATFI's impact. For instance, today the current annual SBIR set-aside is levied at 3.2 percent of annual extramural R&D budgets per agency or department.[8] The FY24 extramural R&D budget for the Department of the Air Force was approximately $33 billion, yielding an estimated SBIR budget of about $1.2 billion (see figure 6).[9] By department policy, the combined Air Force and Space Force offices that administer SBIR programs target no more than 20 percent of this amount for STRATFI awards, meaning the available funds

FIGURE 6 Department of the Air Force annual research, development, test, and evaluation (RDT&E) and estimated extramural budgets



Source: Office of the Under Secretary of Defense (Comptroller)

are inherently limited. In practice, this restricts the entire Department of the Air Force to awarding about twenty-five STRATFIs per year, eight to ten of which go to SpaceWERX, where costs to field operational capabilities are naturally higher due to the need to launch objects into space. Each STRATFI award requires approval from the service acquisition executive, and any SBIR award exceeding $2.1 million must receive a Small Business Administration (SBA) waiver, currently capped at $15 million.[10] The entire process from application to first revenue therefore takes approximately twelve months—an eternity for early-stage startups. These limitations result in fewer operationally deployed capabilities and, from a startup perspective, more distraction through the process of raising the financing required for full-scale deployment.

The fundamental challenge for venture-backed companies is a misalignment between the incremental milestones of private capital and those of defense buyers, which is perhaps best illustrated by the following example.

Suppose a founding team is considering forming a new business and pursues a Phase I SBIR as a litmus test to validate their concept. The company is awarded a $75,000 contract, which it uses as a market demand signal to solicit $500,000 in pre-seed funding. They use the pre-seed funding to further their concept, meet the Phase I milestones, and leverage this progress into a $2 million Phase II SBIR award. This Phase II award allows them to move from feasibility assessment to design and initial prototyping of a new capability. It also helps them garner a true seed investment from venture investors of $5 million, a level of financing that brings a number of ongoing, fixed costs, with an

office and employees being the largest. They begin design and prototyping work in earnest, with approximately eighteen to twenty-four months of financial runway. Obviously, they need to close their next financing, the Series A, well in advance of that endpoint.

Closing the Series A is a much more substantial hurdle to clear in the venture world than a seed round. This round will typically be in the $15–$25 million range, large enough that venture capitalists will have to convince their colleagues of the true likely size and scope of this opportunity compared to other prospective investments. To make this argument, they need a meaningful demand signal—a contract from a buyer who has the ability to scale to larger future acquisitions. In the defense world, this means moving beyond the purely R&D-focused organizations to winning contracts from an acquisition program office that is responsible for fielding operational capabilities related to the products or services offered by the startup. In practice, a first contract on the order of $20 million will suffice (averaging $10 million per year for two years). At this stage, speed is more important than size. Two years of runway may sound substantial, but in reality the fundraising process has to kick off after the first twelve months. It takes time to raise capital, and getting within three to six months of an empty bank account without completing the next financing round can create a significant disruption to the overall process of building a company. That means the $20 million contract needs to be in place and flowing revenue within twelve months of the Phase II SBIR award.

Closing a Series B financing round is substantially more difficult than closing a Series A. As a company ramps up to close a Series B, it typically has thirty to fifty employees (an annual fixed cost of $6–$10 million in and of itself). It is beginning to "bend metal," and in doing so finding that its initial assumptions related to timeline and developmental costs were optimistic. Further, the company's leadership will be seeking upwards of $50 million in additional financing to both complete and operationally test a fully functioning prototype. At this stage, venture capitalists are being asked to write a substantial check to lead the round, perhaps on the order of 5–10 percent of their total fund size. They can only make so many bets at this scale over the seven-to-ten-year lifetime of their current fund and, therefore, are correspondingly judicious. Getting this round over the finish line will require approximately $20 million in annual revenue, or a contract of $40 million over two years. Based on the same timeline and dynamics as the Series A, this larger contract needs to be awarded and in place within twenty-four months of the initial $20 million contract.

Once the Series B is in place, the company will then have twelve to twenty-four months to complete the milestones required to raise the Series C, which is often upwards of $100 million in additional capital. In the context of defense tech companies, closing this round will require true program office commitments, backed up by congressional appropriations, at levels of $40–$60 million or more annually. In lieu of this level of US-based defense revenue, companies will often look to international defense customers, which have the benefit of being able to sign longer-term agreements. However, these customers also create an additional distraction from the core objective of deploying new capabilities for US warfighters.

In a world where the process works, these ongoing program office commitments mark the exit from the valley of death. The company now has an operationally ready and tested capability that can be deployed at scale using a sole-sourced Phase III SBIR or other traditional acquisition pathways.

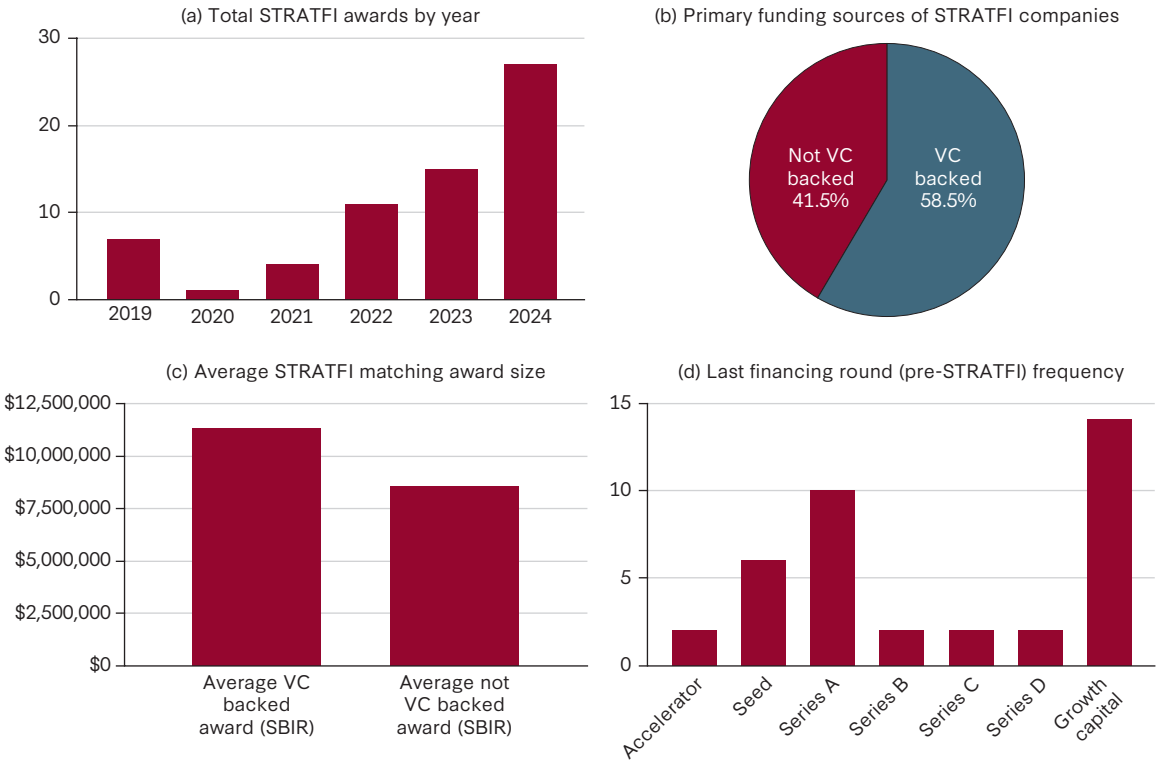
Unfortunately, experience shows that although very well-intentioned, the current system continues to misalign the incremental milestones required for venture-backed companies with those of the defense procurement system—even its more innovative elements.

THE STRATFI EXPERIENCE: BY THE NUMBERS

Between 2019 and 2024, sixty-five companies were awarded contracted STRATFIs.[11] Of these companies, thirty-eight have raised venture capital to support their development (see figure 7).

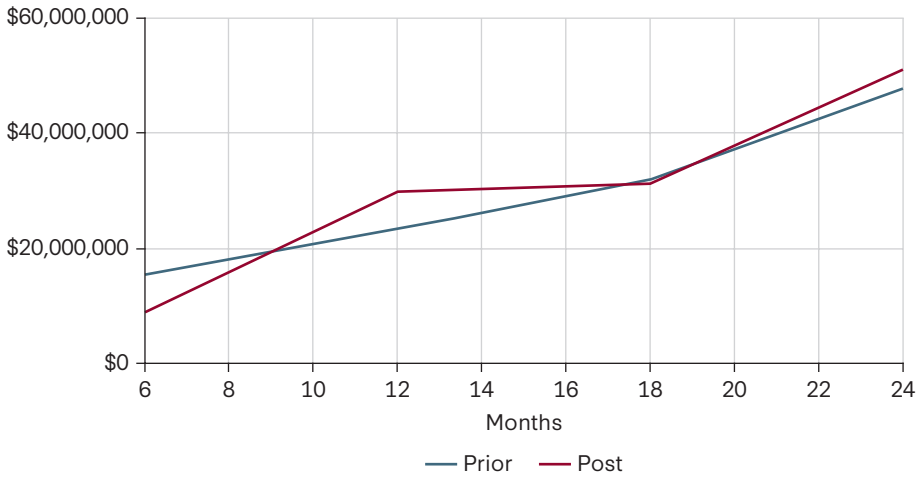
Overall, the average STRATFI matching award was about 30 percent higher for venture-backed companies, as compared to companies that are not backed by venture capital.

FIGURE 7 Statistics related to historical STRATFI awards



Sources: AFWERX (a and c); PitchBook Data Inc. (b and d)

FIGURE 8 Cumulative average venture capital raised within a given period, both prior to and post STRATFI award



Source: PitchBook Data Inc.

Within this venture-backed cohort, ten STRATFI awards preceded (and presumably helped close) a company's Series A financing round. Nearly 50 percent of the STRATFIs awarded to venture-backed companies came after later financing rounds (the Series C financing round or beyond).

Of particular note, in the current implementation there is relatively little difference in the amount of capital raised by these companies within a given period before and after the STRATFI award. For instance, on average these companies raised $31.22 million during the eighteen-month period prior to the STRATFI award and $31.17 million in the eighteen-month period following the award (see figure 8). This consistency likely reflects the fact that current policy allows for private financing from the past twenty-four months to account for the required matching funds.

CHARTING THE PATH AHEAD

In summary, this essay argues that the variety, scope, and pace of developing threats from America's adversaries requires a "bigger tent"—a defense industrial base that combines the many capabilities of historical prime contractors with the speed and responsiveness of emerging venture-backed small businesses.

Furthermore, in pursuing the growth of this new industrial base, it should be an explicit goal not only to create a small number of "new primes" but also to foster an environment where a continuous parade of new companies will emerge to pursue new capabilities. The development "edge" of commercial technologies is simply advancing so quickly that

newly formed companies will almost always be the fastest to design and develop systems using the latest technologies.

Finally, in creating an environment that is conducive to these new companies' emergence, it is essential to align the incremental funding milestones of government revenue programs with those of private investors. This section outlines recommendations that will allow for this alignment to occur at a significant scale.

We believe the first recommendation is critical to fully realizing the potential of these emerging companies to deliver operational capabilities to warfighters across the joint force:

- **The upcoming SBIR/STTR reauthorization should include a DOD-wide program modeled on the Air Force Strategic Funding Increase (STRATFI) program.**

  Current limitation Although the legislative authority for the Commercialization Readiness Program has been in place for more than a decade, there has been a wide disparity in its adoption by the various military departments.

  Impact of recommendation By clarifying the department-wide nature of an evolved, STRATFI-like program, Congress will clearly articulate its intent that each of the military departments implement this program and establish a deeper reliance on the new defense industrial base to provide operational capabilities to warfighters.

Furthermore, this new program should include the following provisions:

- **A larger, predefined SBIR amount that may be awarded to small businesses, without requiring a waiver from the Small Business Administration, when matched by non-SBIR funds.**

  Current limitation The current ceiling of $15 million in SBIR funding, when matched with $15 million in non-SBIR government contracts, results in significantly less annualized revenue than required for companies to meet the expectations of private investors. Furthermore, requiring an SBA waiver for each award unnecessarily slows the process and limits the total number of awards.

  Impact of recommendation A larger, predefined, limit of $30 million in SBIR funding, when matched with $30 million in non-SBIR government contracts, would enable companies to raise the capital needed for transitioning from prototype to operational capability without having to resort to other sales efforts that distract from their core mission. Removing the SBA waiver requirement would help deliver these capabilities much more rapidly to warfighters by eliminating, potentially, months from the award process.

- **The provision of multiple STRATFI-like awards, within a given fiscal and temporal limit.**

  Current limitation Current legislation and policy allows for a single Phase II sequential award, such as a STRATFI, with a period of performance up to four years. This approach fails to align with the standard twenty-four-month cycle of venture investment.

  Impact of recommendation By allowing for multiple STRATFI-like awards within a fixed total time period and maximum total funding, small businesses can get multiple, incremental contract wins, providing the market demand signals that are needed to catalyze multiple rounds of venture funding.

- **A clear articulation of the matching expectations from non-SBIR government funds and private capital, including the provision that private matching capital must come after the award.**

  Current limitation Current legislation does not explicitly specify required matching ratios between SBIR funds, non-SBIR US government funds, and private investment, leading the various services to implement different approaches to matching programs. This results in disparities in the development of new warfighter capabilities between the different services.

  Impact of recommendation Standardizing the matching ratios by legislation will increase the brand value of the new program. Investors, entrepreneurs, and acquisition professionals will all have a common understanding of the level of non-SBIR US government and private investor support that accompanies such an award. As many companies market their capabilities to multiple services, this will allow a wider spectrum of warfighters to access these new operational capabilities quickly.

- **A minimum fraction of the DOD extramural R&D budget to be allocated to STRATFI-like awards.**

  Current limitation There is no current provision for the fraction of SBIR funds that military departments should allocate to the CRP. As such, there is a wide discrepancy in the funds allocated by the various military departments to small businesses through these programs.

  Impact of recommendation Establishing a minimum fraction of total SBIR dollars to be awarded through these programs will help standardize the market opportunity. Private investors will gain confidence that these programs signal market demand on behalf of the US government. They will also better understand the total number of companies likely to receive STRATFI-like awards in any given year.

- **A provision for increased access to funds for administrative overhead, perhaps up to an additional 1 percent of total SBIR funds.**

  Current limitation Current legislation limits administration of CRP to an additional 1 percent of total funds, above the baseline SBIR administration allowance. This limits the total number of program managers and technical evaluators that the services can hire to support these programs.

  Impact of recommendation Increasing the administration allowance would increase the technical bench strength of the government organizations that administer these programs. With additional technical talent, these organizations will be able to evaluate and award proposals covering a wider variety of technologies and potential future capabilities.

- **Reporting requirements to clearly state within the Federal Procurement Data System whether or not a given contract was awarded under this category or counts as a Phase III (commercialization) SBIR.**

  Current limitation The Federal Procurement Data System does not currently have a field clearly indicating whether or not a contract was awarded as a Phase III SBIR. Although some acquisition professionals choose to enter text indicating a Phase II under the "Description of Requirement," this is an inconsistent and incomplete process, limiting the ability to measure impact of the CRP.

  Impact of recommendation Clearly indicating that a contract was a Phase III SBIR would give private investors a clearer understanding of the subsequent revenue opportunities associated with companies participating in STRATFI-like programs. In turn, this understanding would lead them to better understand US government demand signals and increase their likelihood for further investment in these companies.

In addition to SBIR/STTR reauthorization, the following is recommended:

- **The 2025 National Defense Authorization Act (NDAA) should consider an annual SBIR-like levy on congressional program appropriations in order to provide the necessary matching funds for STRATFI-like and/or Phase III SBIR awards.**

  Current limitation Today, program offices must identify funds to support CRP awards (such as STRATFI) or Phase III SBIR awards out of existing congressional appropriations. This severely limits their ability and incentives to award contracts to emerging venture-backed small businesses.

  Impact of recommendation The SBIR approach of levying funds based on extramural R&D budgets has ensured a reliable source of funds for feasibility studies and early prototyping for more than forty years. Following a similar approach for later

prototyping and transition to operational capability would dramatically increase the number of successful transitions from concept to the battlefield. Program executive officers could compete for these funds on an annual basis so that their participation in STRATFI-like programs becomes a pure benefit to their portfolio, instead of a potential liability, if existing programs suffer following reallocation of funds to small business programs.

In addition to the impact of legislative authorities, the implementation process has a major impact on the potential efficacy of these programs. As the CRP evolves, the Department of Defense and military departments should undertake the following:

- **The military departments should implement multiphase STRATFI-like awards with increasing matching requirements and increasing total contract values, consistent with the expectations of private investors. These contracts should each run for a twenty-four-month period of performance.**

  Impact of recommendation Implementing multiphase STRATFI-like awards with twenty-four-month performance periods aligns DOD funding with venture capital milestones, giving companies a stable runway to mature critical technologies. This staged approach compels significant private co-investment at each step, effectively doubling the resources behind promising solutions while reducing the DOD's own risk. The result is a higher likelihood that cutting-edge prototypes bridge the valley of death and transition into fielded capabilities, delivering strategic advantages to warfighters faster.

- **The military departments should consider allocating a substantial portion of their total annual SBIR allocation to these STRATFI-like programs, on the order of 30–50 percent of total budget.**

  Impact of recommendation Channeling a substantial portion of SBIR funds into STRATFI-like awards concentrates resources on the highest-impact innovations. By scaling up support for top-performing projects, this approach accelerates their path to deployment—ensuring warfighters gain access to breakthrough technologies sooner.

- **The military departments should create clear, positive incentives for program executive officers (PEOs) to access and commit to these STRATFI-like programs.**

  Impact of recommendation Creating clear incentives for PEOs to sponsor STRATFI-like projects will pull more innovative startups into mainstream defense programs. With the right incentives, PEOs are more likely to champion emerging technologies, integrating them into acquisition plans and securing funding for their transition. This accelerates modernization across the force and demonstrates to

entrepreneurs and investors that DOD leadership actively supports scaling new solutions into programs of record.

- **The defense acquisition executive (DAE) should provide clear guidance and education to the acquisition workforce on the appropriate prioritization and usage of Phase III SBIRs.**

  Impact of recommendation Clear guidance and education from the DAE on SBIR Phase III usage empowers the acquisition workforce to transition innovations more rapidly. By removing ambiguity and increasing education, program offices can confidently use Phase III contracts to award follow-on production contracts to successful SBIR projects, cutting through red tape. This top-down emphasis expedites delivery of new capabilities to the field and assures startups and their investors that a clear, supported pathway exists from prototype to full-scale adoption.

- **The military departments should measure, track, and communicate key metrics associated with time-to-award and payments against awards.**

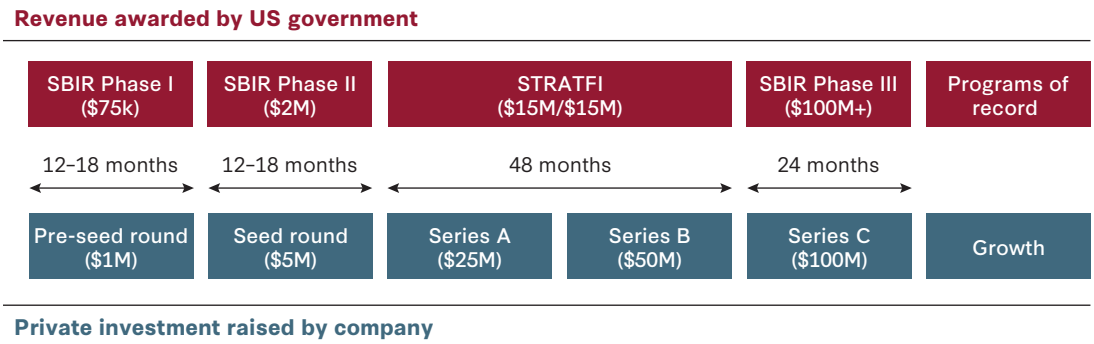
  Impact of recommendation Measuring and openly tracking metrics like contract award speed will hold the acquisition system accountable for improvement. By spotlighting these performance indicators, the DOD will drive process changes that get contracts awarded faster, directly benefiting warfighters with quicker access to new technology. This focus on timeliness also strengthens the defense innovation ecosystem; small businesses gain confidence that doing business with the DOD won't jeopardize their financial runways.

These recommendations would make a substantial contribution to building a dynamic and capable new defense industrial base. Their potential impact can perhaps best be understood through a detailed comparison of the current and proposed innovation funding models.

As shown in figure 9, the current STRATFI program spans a period of performance of up to four years. In an early-stage venture-backed company, the time between financing rounds is typically closer to two years. Unfortunately, this means that, in the current model, there is no new and significant milestone to drive closure of a subsequent financing round, that is, a "second press release." Furthermore, the fact that financing raised within the previous twenty-four months can count toward the private financing match means that current STRATFI awards play a relatively small role in securing additional private financing.

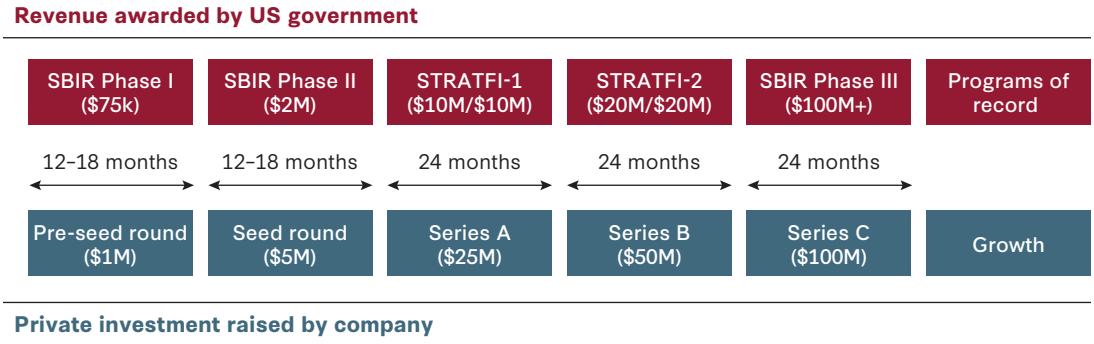
However, as shown in figure 10, aligning incremental revenue milestones with incremental financing milestones would result in a different model. Although this could work in many ways, we propose the model shown below. It has two distinct changes from the previous STRATFI model.

FIGURE 9 The current STRATFI model



Source: Figure by the authors using data from SBA, STRATFI, and PitchBook Data Inc.

FIGURE 10 The proposed evolved STRATFI model



Source: Figure by the authors using data from SBA, STRATFI, and PitchBook Data Inc.

In the new model, two separate contracts could be awarded that would each drive closure of new private financing. The first STRATFI would span two years and take the company to an annual recurring revenue (ARR) of $10 million per year, for a total award of $10 million in non-SBIR government contracts and $10 million in matching SBIR funds. Accessing these funds would require the company to raise $20 million in private capital, similar to the existing 1:1:2 matching model. However, this capital would have to be raised after the date of the first, STRATFI-1, award.

The second award, STRATFI-2, would come two years after the STRATFI-1. It would be a larger award, consistent with the $20 million plus in ARR expected by private investors at the Series B stage of a company. Like the STRATFI-1, it would require private investors to commit an amount equal to or greater than the total government obligation of the award, in this case $40 million or more. Dividing the overall STRATFI program into two phases should improve outcomes in two ways. First, it will provide a second customer-development milestone, the award of a larger, follow-on contract, to

catalyze the subsequent private investment round. Second, it will provide an additional opportunity for government acquirers to decide whether or not to continue based on company performance. This step in the process would be enormously aided by the creation of dedicated transition dollars, either as a separate appropriated line item or as an SBIR-like levy on other program dollars, which service acquisition executives could competitively award to program offices as the bulk of the STRATFI-2 matching dollars. The internal award of this funding could also be contingent on planning and the likelihood of future program dollars materializing to support a follow-on Phase III after successful completion of the STRATFI-2. This would drive program offices to begin the planning, programming, and budgeting process so that Phase III funds are ready to execute at the end of the twenty-four-month period of performance of the STRATFI-2.

Finally, the new model would increase the overall level of government funding between the two STRATFI phases to be at a level consistent with both investor expectations and with the true costs companies incur to move beyond prototypes to operational capabilities. At current funding levels, there is a significant risk of mortgaging the future through present-day cost savings. While it may seem prudent to limit the overall level of the STRATFI program, if these companies are not funded in a way that reflects actual costs, they will either (1) have a lower likelihood of reaching full operational deployment or (2) be forced to split their bandwidth by pursuing foreign defense or domestic commercial sales that will consume significant portions of their limited bandwidth.

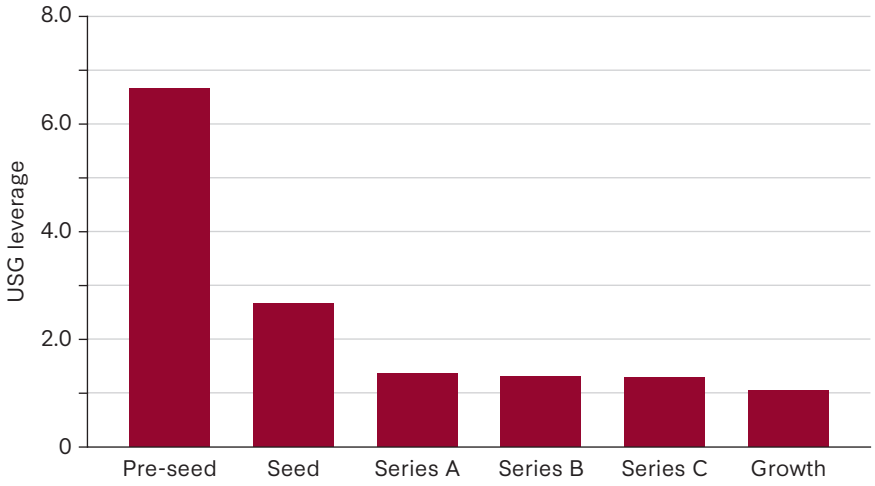
Considering this overall model, it is important to think about the total investment required to achieve outcomes versus the costs incurred during an individual phase. Following this approach yields significant benefits for the government compared with traditional research and development models. From the initial Phase I SBIR onward, this model allows the government to gain substantial leverage on each dollar brought to the table. This means that, as shown in figure 11, should a Phase I SBIR concept prove infeasible, private capital has put at risk upwards of six dollars for every dollar awarded by the government.

Ultimately, the extent to which venture-backed small businesses play a role in the nation's defense strategy will be determined by the new administration and Congress. If these companies are seen as an important part of strengthening national security, relatively minor adjustments to policy and legislation could dramatically expand their impact in delivering operational systems at scale. Structuring SBIR, STRATFI, and transition programs in a way that supports full-scale operational deployment rather than prolonged prototyping could finally unlock the full potential of venture-backed defense innovation.

FINAL THOUGHTS

Building the twenty-first-century warfighting capabilities necessary to deter or defeat America's adversaries must balance faster integration of advanced, emerging technologies with judicious financial, programmatic, and technical risk management. A greater

FIGURE 11 Approximate public leverage on private funding, by round



Source: Figure by the authors using data from SBA, STRATFI, and PitchBook Data Inc.

reliance on venture-backed small businesses to solve difficult national security problems does not come risk free. However, neither does a complete reliance on the traditional defense industrial base. Ultimately, acquisition professionals need the tools—and incentives—to fully maximize the capabilities of both the new and the old.

Building on the significant foundations of the Commercialization Readiness Program, particularly the STRATFI program, through relatively modest legislative and policy reform should play a pivotal role in unleashing the next wave of defense industrial transformation. By tightly coupling these programs with private capital, US warfighters stand to gain significant edge—provided by this uniquely American national capability.

NOTES

1. Roger Wicker, "Restoring Freedom's Forge: American Innovation Unleashed," Office of Mississippi Senator Roger Wicker, 2024.

2. *Red teaming* is a term derived from cybersecurity and denotes a process where outside experts test assumptions and identify weaknesses in a given approach.

3. Philip Taubman, *Secret Empire: Eisenhower, the CIA, and the Hidden Story of America's Space Espionage* (Simon & Schuster, 2003).

4. Ernst & Young, "The US Defense Industry: Key Issues for the 1990s," 1989.

5. As an approximation, investors often expect these companies to be valued at about ten times trailing twelve-month revenue upon exit (acquisition or initial public offering). Similarly, early-stage investors will expect to be diluted to about 10 percent ownership through subsequent financing rounds. These two factors balance out so that an investor expecting a company to ultimately be valued at $500 million would want that same company to reach $500 million in revenue.

6. Congressional Research Service, "Small Business Research Programs: SBIR and STTR," R43695, October 21, 2022.

7. AFWERX, “Strategic Funding Increase and Tactical Funding Increase (STRATFI/TACFI),” accessed March 4, 2025, https://afwerx.com/divisions/ventures/stratfi-tacfi/.

8. Small Business Administration, “FY22 SBIR/STTR Annual Report,” 2023, accessed March 4, 2025, https://www.sbir.gov/sites/default/files/SBA_FY22_SBIR_STTR_Annual_Report.pdf.

9. Department of Defense, Fiscal Year 2025 Budget Request Overview Book, Office of the Under Secretary of Defense (Comptroller), 2024.

10. Small Business Administration, “About SBIR and STTR,” accessed March 4, 2025, https://www.sbir.gov/about.

11. AFWERX Portfolio, accessed March 12, 2025, https://afwerx.com/divisions/ventures/portfolio/.

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